IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of the Claims:

1. (Currently amended) A phased array antenna system with variable electrical tilt and including an array ~~(60)~~ of antenna elements ~~(60U1 to 60L[n])~~ ~~characterised in that it incorporates~~ comprising:

   a) a divider ~~(44)~~ for dividing a radio frequency (RF) carrier signal into first and second signals,

   b) a variable phase shifter ~~(46)~~ for introducing a variable relative phase shift between the first and second signals,

   c) a phase to power converter ~~(50)~~ for converting the relatively phase shifted first and second signals into signals whose powers are a function of the relative phase shift,

   d) first and second power splitters ~~(52, 54)~~ for dividing the converted signals into at least two sets of divided signals, the total number of divided signals in the sets being at least equal to the number of antenna elements in the array,

   e) power to phase converters ~~(56)~~ for combining pairs of divided signals from different power splitters to provide vector sum and difference components with appropriate phase for supply to respective pairs of antenna elements ~~(e.g. 60U[n], 60L[n])~~ located at like distances with respect to an array centre ~~(62)~~.

2. (Currently amended) A system according to Claim 1 ~~characterised in that it has~~ having an odd number of antenna elements ~~(E0 to E7L)~~ comprising a central antenna element ~~(E0)~~ located centrally of each pair of like distant antenna elements ~~(e.g. E7U, E7L)~~.

3. (Currently amended) A system according to Claim 2 ~~characterised in that includes~~ including a third power splitter ~~(120)~~ connected between the phase to power converter and one of the first and second power splitters ~~(88a , 88b)~~ and arranged to divert to the

central antenna element ~~(E0)~~ a proportion of the power from the phase to power converter ~~(82/86)~~.

4. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein the phase to power and power to phase converters ~~(50, 56)~~ are combinations of phase shifters ~~(82)~~ and quadrature hybrid couplers ~~(86)~~.

5. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein the phase to power and power to phase converters are combinations of phase shifters and 180 degree hybrid couplers.

6. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein the divider ~~(144)~~, phase shifter ~~(146)~~, phase to power and power to phase converters ~~(150, 156)~~ and power splitters ~~(152, 154)~~ are co-located with the array ~~(160)~~ of antenna elements as an antenna assembly ~~(144),~~ and the assembly ~~(144)~~ has a single RF input power feed ~~(165)~~ from a remote source.

7. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein the divider ~~(e.g. 244T1)~~ and phase shifter ~~(e.g. 246T1A)~~ are located remotely from the phase to power and power to phase converters, the power splitters ~~(collectively 215)~~ and the array ~~(205)~~ of antenna elements which are co-located as an antenna assembly, and the assembly has dual RF input power feeds ~~(213A, 213B)~~ from a remote source.

8. (Currently amended) A system according to Claim 7 ~~characterised in that~~ wherein the divider ~~(e.g. 244T1)~~ and phase shifter ~~(e.g. 246T1A)~~ are co-located with the remote source for use by an operator ~~(201, 202)~~ in varying angle of electrical tilt.

9. (Currently amended) A system according to Claim 7 ~~characterised in that~~ including duplexers ~~(211A, 211B)~~ to combine signals passing from or divide signals passing to different operators ~~(201, 202)~~ which share the antenna system ~~(200)~~.

10. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein the power splitters ~~(52, 54)~~ are arranged to provide for the antenna elements ~~(e.g. 60U1)~~ to receive drive voltages which fall from a maximum centrally of the antenna array ~~(60)~~ to a minimum at array ends ~~(60U[n], 60L[n])~~.

11. (Currently amended) A system according to Claim 1 ~~characterised in that~~ wherein one power splitter ~~(54)~~ is arranged to provide a set of voltages which rise from a minimum to a maximum associated with the antenna array centre and its ends respectively, as appropriate to establish a progressive phase front across the antenna array, the phase front being substantially linear as an angle of tilt is increased in a working range of tilt, as required for reasonable boresight gain and side lobe suppression.

12. (Currently amended) A method of providing variable electrical tilt in a phased array antenna system ~~(40)~~ including an array ~~(60)~~ antenna elements ~~(e.g. 60U1)~~ ~~characterised in that~~ wherein the method ~~incorporates~~ comprising the steps of:

a) dividing a radio frequency ~~(RF)~~ carrier signal into first and second signals,

b) introducing a variable relative phase shift between the first and second signals,

c) converting the relatively phase shifted first and second signals into signals whose powers are a function of the relative phase shift,

d) using power splitters ~~(52, 54)~~ to divide the converted signals into at least two sets of divided signals, the total number of divided signals in the sets being at least equal to the number of antenna elements in the array,

e) combining pairs of divided signals from different power splitters ~~(52, 54)~~ to provide vector sum and difference components with appropriate phase and supplying the components to respective pairs of antenna elements located at like distances with respect to an array centre.

13. (Currently amended) A method according to Claim 12 ~~characterised in that~~ wherein the antenna array has an odd number of antenna elements ~~(E0 to E7L)~~ comprising a central antenna element ~~(E0)~~ located centrally of each pair of like distant antenna elements ~~(e.g. E1U, E1L)~~.

14. (Currently amended) A method according to Claim 13 ~~characterised in that~~ wherein the phased array antenna system includes a third power splitter ~~(120)~~ connected to receive one of the signals whose power is a function of the relative phase shift and the method includes using such splitter to divert to the central element ~~(E0)~~ a proportion of the power in such signal.

15. (Currently amended) A method according to Claim 12 ~~characterised in that~~ wherein conversion of the relatively phase shifted first and second signals and combining of pairs of divided signals are implemented respectively using phase to power and power to phase converters incorporating 90 or 180 degree hybrid couplers.

16. (Currently amended) A method according to Claim 12 ~~characterised in that~~ wherein steps a) to e) are implemented using components ~~(144 to 158)~~ co-located with the array ~~(160)~~ of antenna elements to form an antenna assembly with input from a single RF input power feed ~~(165)~~ from a remote source.

17. (Currently amended) A method according to Claim 12 ~~characterised in that~~ wherein steps a) and b) are implemented using components ~~(e.g. 244T1, 246T1A)~~ located remotely of the array ~~(205)~~ of antenna elements and steps c) to e) are implemented using components ~~(215)~~ co-located with the array ~~(205)~~ and forming therewith an antenna assembly having dual RF input power feeds ~~(213A, 213B)~~ from a remote source.

18. (Currently amended) A method according to Claim 17 ~~characterised in that~~ wherein step b) includes varying the relative phase shift to vary the angle of electrical tilt.

19. (Currently amended) A method according to Claim 17 ~~characterised in that includes~~ including combining signals passing from or dividing signals passing to different operators ~~(201, 202)~~ which share the antenna system ~~(200)~~.

20. (Currently amended) A method according to Claim 12 ~~characterised in that it includes~~ including providing for the antenna elements to receive drive voltages which fall from a maximum centrally of the antenna array to a minimum at array ends.

21. (Currently amended) A method according to Claim 12 ~~characterised in that~~ wherein step d) includes providing for one set of divided signals to rise from a minimum to a maximum associated with the antenna array centre and its ends respectively, as appropriate to establish a progressive phase front across the antenna array, the phase front being substantially linear as an angle of tilt is increased in a working range of tilt, as required for reasonable boresight gain and side lobe suppression.

22. (New) A method according to Claim 13 wherein:

a) the variable phase shift is a first variable phase shift introduced in a transmit path,

b) the method includes introducing a second variable phase shift in a receive path,

c) the antenna system is operative in one direction in transmit mode and in a reverse direction in receive mode, and

d) the method includes adjusting the antenna system's angles of electrical tilt in transmit and receive modes independently by adjusting the first and second variable phase shifts respectively.

23. (New) A system according to Claim 1 wherein:

a) the variable phase shifter is a first variable phase shifter associated with first filtering means defining a transmit path,

b) the system includes a second variable phase shifter associated with second filtering means defining a receive path,

c) the system also includes elements operative in one direction in transmit mode and in a reverse direction in receive mode, and

d) the system's angles of electrical tilt in transmit and receive modes are independently adjustable by means of the first and second variable phase shifters respectively.